by the OBSI rodeo conducted in September 2010 in Elkin, North Carolina and in the subsequent field data collection across North Carolina.

Tire-pavement noise data was collected for the first time in North Carolina, which included nine types of pavements operated and maintained by the North Carolina Department of Transportation. OBSI data collected included typical pavements on interstate, US and NC highways. Pavements investigated included surface courses S9.5 series, S12.5 series, open grade friction course (OGFC), and also concrete pavement with diamond ground textures. Based on the OBSI data, the tested pavements were ranked based on OBSI levels, and quieter pavements were identified.

The overall OBSI results indicated that in the eight types of asphalt pavements tested, the average sound intensity ranged from 98.3 dBA to 99.7 dBA, which are generally lower than those from some other states with similar types of pavements (33). This result can be interpreted that there are 'quieter' pavements used in North Carolina, especially in volume roads. In this project, the highest average noise level captured for a single test section was 105.1 dBA[2], this is also lower than the high values collected in other states from all types of pavements. It has been found that the difference between the lowest average noise level (98.3 dBA) and highest (103.2 dBA) is 4.9 dBA. This proved that quieter pavements have been used consistently in North Carolina in recent years on low volume roads.

OBSI data was also collected for selected pavement sections with various driving speeds to compare the effect of driving speed on the tire-pavement noise levels. Results showed that the relationships between driving speed and sound intensity level followed linear relationship regardless pavement types. For example, for an S9.5B test section, sound intensity ranges from 86.8 dBA at 25 mph to 98.5 dBA at 60 mph. S9.5C followed the same trend.

Based on the findings, recommendations can be made for further research on pavement noise. In this project one to three year old pavements were selected for OBSI measurement. This will make the data comparable to those from other states and the national database. However, it is known that tire-pavement noise levels will be higher as the pavement ages, and the relationships between sound intensity noise level and pavement age ('tire-pavement noise deterioration rate') may be different for different pavement. It is recommended that pavement noise levels at different ages be further investigated in future research. This will provide information on the change rate of pavement noise levels during the entire service life for a particular pavement. It is the authors' opinion of this report that when defining a 'quieter pavement', both factors should be considered, i.e., sound intensity noise level and sound intensity noise deterioration rate.

[2] An average of 105.1 dBA was measured on an OGFC test section in this project. Refer to Chapter 4 for detailed information.